

## **Opportunistic Insider Trading\***

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### **Abstract**

This study proposes a simple framework to disentangle insiders' opportunistic trades from liquidity trades. We identify an opportunistic trade when the probability of informed trading and the speed of convergence to market efficiency increase in a month after an insider trading. Using the sample of insider trading activities in the Stock Exchange of Thailand from Form 59-1 and 59-2 filed at the Securities Exchange Commission during 2002 to 2008, we show that an opportunistic portfolio yields a monthly average of 2.03% and 2.08% in the first month after insiders buy and sell respectively. In contrast, a traditional insider portfolio that includes liquidity and opportunistic trades, achieve merely 0.64% and 0.32% per month following insiders purchase and sell. The profitability from an opportunistic insider portfolio is robust to several portfolio performance measures.

Keywords: insiders; opportunistic-trade; probability of informed trading; market efficiency; portfolio performance

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## **Opportunistic Insider Trading**

### **1. Introduction**

Prohibiting insider trading is a common practice in almost all stock exchanges around the world. At least 22 developed countries and 80 percent of the 81 emerging markets have insider trading laws in place in 1998 (Bhattacharya and Daouk, 2002). A widespread existence of insider trading regulation around the world reflects unanimous view of regulators that insider trading should be prohibited to protect outsiders and assure the level playing field. While regulators believe insiders exploit their superior private information through trading, the evidence in the academic literature on profitability of insider trading is far from being conclusive.

Early evidence shows insider trading is informative because outsiders could achieve abnormal profit from observing insider trade information (See Lorie and Niederhoffer, 1968; Jaffe, 1974; Seyhun, 1986, 1998; Rozeff and Zaman, 1988; Lin and Howe, 1990). Aboody and Lev (2000) suggest the source of insiders' private information come from the ability to planned changes in the research and development budgets. In contrast, recent evidence is inconsistent with prior research. Lakonishok and Lee (2001) show limited market movement when insiders trade or report their trade to SEC. Jeng, Metrick and Zeckhauser (2003) find insiders sales do not significant earn abnormal returns. Eckbo and Smith (1998) show evidence in an insider friendly market such as the Oslo Stock Exchange (OSE), a conditional performance measures that closely tracks the true insider trades performance more than the traditional event study methodology reveal zero or negative abnormal insider returns. They conclude either OSE insiders possess little information or insider's benefits of control outweigh their benefits of trading.

Are insiders really informed? An informed insider conveys superior and useful information to outsiders via their trades. If this is the case, one should expect price efficiency to increase following trading of an informed insider. Nevertheless, not all insider trades equally contain relevant information. An insider trade could be uninformative and does not improve price efficiency if the objective of such trade is for liquidity. We therefore separate insider trades into opportunistic and liquidity trades.

Only opportunistic insiders exploit their superior information to trade and contribute to price efficiency.

Separating opportunistic insider from liquidity insider is crucial for the regulator to understand the impact of insider trade on the financial market. Only a few studies explicitly distinguish the role of opportunistic insider trade from liquidity insider trade. This study offers two contributions to the opportunistic insider trading literature. First we suggest a simple measure of opportunistic insider trade. The empirical measures of opportunistic insider are very useful for regulators to enforce the insider dealing legislation. We propose a measure of opportunistic insider trading based on theoretical prediction of Leland (1992) who studied the consequence of insider trading under a rational expectation model with endogenous investment level. When insider trading is permitted, markets are less liquid as a result of asymmetric information and stock prices better reflect information. Aktas, de Bolt, and Oppens (2008) show that price discovery happens sooner on insider trading days. This suggests asymmetric information and informational price efficiency will increase following a period that opportunistic insider trades.

Our second contribution is the study of profitability of opportunistic insider trades. After classifying insider trades based on opportunistic and liquidity based motivation, we revisit the profitability of insider trading evidence. In particular we test the idea that outsiders who follow opportunistic insider trades should on average benefit from their trades. We compare profitability of opportunistic and liquidity based insider trades. All empirical studies on profitability of insider trade so far do not explicitly differentiate opportunistic trading from liquidity trading. The investigation of insider trading performance conditional on the degree of opportunistic trading should allow us to shed more light on to why some studies do not find insiders trading informative. We look at the profitability to insiders and to outsiders who construct the strategy using insider filing report. Furthermore Meulbroek (1992) reports that a number of litigation cases against insider share sale are much higher than insider share purchase. Hence we examine whether an opportunistic insider sale would achieve higher profit than an opportunistic insider purchase.

To our best knowledge there are three recent researches that suggest the methodology to identify opportunistic insider trades. Rozanov (2008) propose the 'PricePattern' as a proxy for opportunistic trading. The 'PricePattern' is computed from the ratio of the 20-trading day cumulative market-adjusted gross return after an insider trade to the 20-tradingday before an insider trade. The high value of 'PricePattern' indicates increased likelihood of opportunistic insider trade. Gunny, Ke, and Zhang (2008) propose the 'OIT' as a measure of opportunistic insider trading. The OIT captures a reverse pattern in abnormal returns around an opportunistic insider trade. In particular, one should observe a negative abnormal return prior to an opportunistic insider stock purchase and positive abnormal return subsequently. While 'PricePattern' and 'OIT' measures are very useful to study the relation of corporate governance and opportunistic insider trading, both measures cannot be computed ex-ante because 'PricePattern' and 'OIT' measures assume that opportunistic insiders profit from their firm-specific information. Moreover, while such assumption appears reasonable, a rising tide could lift all boats. Market-wide aggregate information such as economy and business conditions can be informative about future return, (Albuquerque, Francisco and Marques, 2008), and there is a possibility that market-wide information may offset the firm-specific private information. Furthermore Eckbo and Smith (1998) use a comprehensive database that tracks movement of insiders in and out of the firms listed on the Oslo Stock Exchange to show that insiders' abnormal performance are zero or negative under the period of lax enforcement of insider trading regulation. In addition, Luo (2005) use an event of mergers and acquisitions to show that market reaction to the announcement strongly predict whether firms later complete the deal implying that outsiders or market has more information that firm or insiders does not know. These conflicting evidences cast doubt on assumption that opportunistic insider measures should be associated with the abnormal returns of insider trade.

On one hand, our methodology is consistent with the routine trading method of Cohen, Malloy and Palmoski (2010) because both approaches can ex-ante identify routine trades and opportunistic trades. Routine trades are trades that occur at the same months for a certain number of years. They show that approximately half of insider transactions are routine trades. Insiders could routinely trade for diversification or

liquidity so a routine insider trading is not informative about future returns of the firm but an opportunistic insider trading portfolio yields value-weighted abnormal return of 82 basis points per month. On the other hand, routine trading approach requires current and historical insider identification so the routine trading approach is restrictive for newly listed firms or in the market that does not reveal insider's identification. Our opportunistic method while requires additional data to compute the measures of informational efficiency and probability of informed trade, our approach does not require insider identification. Our approach is therefore particularly useful for the case of newly listed firms or when information about insider's identification is not available.

This study aims to investigate opportunistic insider trading behavior in Thai capital market. Most insider trading studies so far have been limited to the developed market, especially the US market which has a relatively high level of informational efficiency and rigor governance mechanism. In contrast, the Stock Exchange of Thailand (SET) provides us with an emerging market environment where price may not efficiently reflect information; ownership structure is dominated by family-control; the possibility of wealth expropriation of outsiders from insiders; the relatively weak corporate governance compared to the US market. Thai authorities established insider trading law in 1984 and enforced it in 1993 (Bhattacharya and Daouk, 2002). The SET is known ex-ante to be experiencing several insider trading scandals. The Securities and Exchange Commission secretary-general Thirachai Phuvanatanarubala admitted that the SET suffers from market abuses in terms of stock price manipulation and insider trading. In 2006 SEC fined four cases on insider trading to the amount of 20 million baht.<sup>1</sup> There is no sign that insider trading problem on SET does subside. In a recent incident on June 2007, Paiboon Damrongchaitham a founder and chairman of GMM has been fined 31.77 million baht for criminal insider trading in shares of the publisher Matichon Plc.<sup>2</sup> According to the World Bank governance indicator, Thailand receives a significantly less score in terms of regulatory quality and rule of law compared to the US.<sup>3</sup> Lemmon and Lins (2003) show that agency problem between insiders and outsiders are more severe in East Asian

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<sup>1</sup> See [http://www.sec.or.th/infocenter/th/speech/enforcement\\_23jan07.pdf](http://www.sec.or.th/infocenter/th/speech/enforcement_23jan07.pdf)

<sup>2</sup> See <http://www.asiamedia.ucla.edu/article-southeastasia.asp?parentid=72038>

<sup>3</sup> In 2008, US and Thailand governance scores are 93 and 64 for regulator quality and 92 and 50 for rule of law respectively. (Source: <http://info.worldbank.org/governance/wgi/index.asp>)

markets due to weak legal protection and lack of external governance mechanism. The dominance of family-control structure combined with relatively weak corporate governance in Thailand provides a platform suitable to study an opportunistic insider trading.

We classify each insider trade into opportunistic and liquidity trade. As discussed above, the opportunistic insider trade increases information asymmetry and improves price efficiency. We therefore select opportunistic insider trade from records of insider trades that the percentage increases of information asymmetry and price efficiency in that trading month compared to the past one year prior are in the top 30 percentile. We find our simple opportunistic insider framework perform relatively well. The opportunistic insider buy portfolio earns an average 2.03% per month and the opportunistic sell portfolio returns 2.08%. The typical insiders' buy and sell portfolios only yield 0.64% and 0.32% respectively. The long-short strategy that purchases stocks that opportunistic insider buys and shorts stocks that opportunistic insider sells significantly outperform the buy-and-hold strategy. The long-short opportunistic portfolio produces the 0.2809 Sharpe ratio compared to the 0.0644 from the buy-and-hold strategy. The Jensen alpha of the long-short portfolio is 3.48% per month which is highly significant. The magnitude of the outperformance is far higher than the possible transaction cost that might incur. The manipulation-proof portfolio measures (MPPM) of Ingersoll, Spiegel, Goetzmann, and Welch (2007) show that the opportunistic insider portfolio statistically outperforms the buy-and-hold investment.

Our simple opportunism proxy will be useful for regulators and investors to address a wide range of issues. While this study addresses the issue regarding the profitability of opportunistic insiders, it is interesting to examine the relation of opportunistic trading and effectiveness of corporate governance mechanisms or managerial opportunism such as earning manipulation. We leave the latter topic for future research.

The rest of the paper is organized as follows. Section 2 presents description of insider trading data, trading and stock characteristic data. Section 3 discusses opportunistic insider trading framework. Section 4 presents the stock market reactions and portfolio performance of insider trades. Section 5 concludes the study.

## **2. Data**

### *2.1 Insider transaction data*

Under the Securities and Exchange Act of B.E. 2535 Section 59, managers must report their trading in securities of their own firm within 3 days after the transaction date. The insider trading information is collected from the 59-2 form provided by the Securities and Exchange Commission (SEC). Form 59-2 reports all of each manager transactions in the past until the current year. The data contains position, report date which is a date insiders submit the form to SEC, filing date which is a date SEC receives the form (usually the same as report date), transaction date, security type, number of shares traded, average security price and method of acquisition and disposition. The identity of insider can be classified into officers, directors, chief officers, chief directors, CEOs and presidents, chairman of the board of directors, and large shareholders. The information of large shareholders trading can be obtained from the Form 246-1. The insider-trading activity is announced by the SEC one day after receiving the form. Although the insider trading law was implemented in 1993, the quality of the data in earlier years was poor and incomplete. Important information such as the insider transaction prices were missing. To ensure a high quality and complete data, our data spans the period from January 2002 to December 2008. We exclude records with less than 100 shares trade from our analysis and only individual trades in common stocks are included in the sample. We exclude rights transfer and executive stock option exercise records.

*Please insert Table 1 around here*

The insider trading activities in terms of the number of trades, trading value and trade sizes of insider purchases and sales for each year from 2002 to 2008 are shown in Table 1. We can see that the number and trade values of insider sells are generally higher than the number of insider buys. This is consistent with the diversification benefit argument that insiders would like to diversify their personal wealth. Similarly we observe that trade sizes are larger when insiders sell than when they purchase. We do not see a clear pattern

that stock market performance influence insiders to buy and to sell. For instance, when stock market rose 81% in 2003 we observe insiders bought shares in total of 5.4 billion bath and they sold shares worth 12 billion Baht in the same year. In 2004, when the aggregate market was down by 3%, insiders bought and sold 4.7 and 10.9 billion Baht respectively.

## *2.2 Trading and stock characteristics information*

We identify opportunistic insider transactions using the measures of information asymmetry and informational price efficiency. Both measures are computed from trade and quote data of all common stocks traded on the main board of SET from January 2002 to December 2008 available from the Reuters DataScope Tick History (RDTH)<sup>4</sup>. We obtain daily stock returns from the Datastream from January 2002 to January 2009. An additional month is required to test the profitability of opportunistic insider trades. Control variables of stock characteristics include market capitalization, effective spread and trading value which are available from Datastream. We collect stock market return, 3-month government bond yield, 10-year government bond yield, prime lending rate and dividend yield from the Global Financial Database.

## **3. Opportunistic insider trading framework**

We identify an opportunistic insider trading based on a theoretical prediction of Leland (1992) that the likelihood of opportunistic insider trade should be positively associated with the degree of information asymmetry and the informational price efficiency. The widely used measure of informed trading is the ‘probability of informed trading’ (PIN) proposed by Easley, Kiefer, O’Hara and Paperman (1996). The PIN however cannot be reliably calculated for very short intervals when information asymmetry is likely to be prevalent. Easley, Hvidkjaer and O’Hara (2002) suggest the PIN should be estimated from at least 60 daily intervals. Kaul, Lei and Stoffman (2008) show that under conditions that are consistent with the theoretical modeling of PIN, order

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<sup>4</sup> <https://tickhistory.datascope.reuters.com/>

imbalances are a good proxy for information asymmetry. They show that there exists a positive and linear relation between the PIN and absolute percentage order imbalances (AIM). The strengths of AIM as asymmetric information measure are twofold. First, it does not require an optimization of a complex likelihood function which is susceptible to the local solution and the underflow/overflow problems. Second and more importantly the probability of informed trading of Easley et al. (1996) and estimated asymmetric information component from spread decomposition models<sup>5</sup> require a multiple days of transaction data. AIM model can estimate probability of informed trading for each day. As a result, we measure the degree of information asymmetry using the AIM.

$$AIM = \frac{|B-S|}{|B+S|} \quad (1)$$

Where B and S are the number of buy and sell initiated trades. We calculate the daily AIM and for each month we average the AIM across all trading days in that month.

We measure informational price efficiency based on the ingenious technique of Chordia, Roll and Subrahmanyam (2005) who examine the speed of convergence to market efficiency. In a frictionless world, price in an efficient market should reflect information instantaneously. In the real world, with institutional structure and trading frictions in place, price may take some time to incorporate new information from trading. For instance, Visaltanachoti and Yang (2009) show that foreign stocks listed on the NYSE take 30 to 60 minutes compared to a comparable NYSE stocks that take 10 to 15 minutes. Informational price efficiency can be measured from the following regression:

$$MidPointReturn_t = \alpha + \beta MidPointReturn_{t-1} + \gamma OrderImbalance_{t-1} + \varepsilon_t \quad (2)$$

Where *OrderImbalance* is the difference between buy and sell initiated trade volume in dollars. The time interval, t, is set at daily interval. For each month and each individual stock, we run the regression and obtain the R-square. As suggested by Chordia, Roll and

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<sup>5</sup> Popular bid ask spread decomposition models include Glosten and Harris (1998), George, Kaul and Nimalendran (1991), Lin, Sanger and Booth (1995), Madhavan, Richardson and Roomans (1997), and Huang and Stoll (1997).

Subrahmanyam (2005), if the price is fully efficient, then the quote midpoint should follow a random walk and the R-square of the regression in the equation 2 should be close to zero. If a midpoint return can be fully predicted from the lagged midpoint return and lagged order imbalance then the R-square is equal to one and the speed to market efficiency is zero. On the other hand, if a midpoint return is completely unpredictable the R-square is equal to zero and the speed to market efficiency is one indicating the fastest speed of adjustment to market efficiency.

We employ two steps to identify the opportunistic insider trades using the information asymmetry and speed to market efficiency. We follow Leland (1992) and select insider trades that increase both degree of information asymmetry (AIM rises) and the speed of convergence to market efficiency ( $R^2$  declines) relative to its value in the last 12 months. Nevertheless, the increase in speed and information asymmetry might be a result of changes in a general market environment such as the better country corporate governance regulation, the reduction in trading costs and improved liquidity, and the improved information dissemination technology. Hence, our second step is selecting insider trades that their percentage increases are in the top 30 percentile across all stocks in the market in the insider trading report month. After identifying opportunistic insider trades, we label non-opportunistic insider trades as liquidity insider trades.

*Please insert Table 2 and Table 3 around here*

Table 2 presents a cross-sectional average of information asymmetry and speed of convergence to market efficiency. The information asymmetry proxy is the absolute percentage change of order imbalance (AIM). Higher AIM indicates higher degree of information asymmetry. The speed of convergence to market efficiency is the percentage  $R^2$  of the predictive regression between daily mid-point return and lagged daily midpoint return and lagged order imbalance within the month. The lower  $R^2$  implies the faster speed of convergence to market efficiency. The cross-sectional average of all stocks on the Stock Exchange of Thailand has the information asymmetry in range of 0.42 to 0.48 during 2002 to 2008. Interestingly, we find that the information asymmetry of insider trades stocks are from 0.31 to 0.38 which are lower than the level found in all stocks. The

results are quite surprising because if insider trades are informative, one should expect to observe a higher degree of information asymmetry. The findings suggest that there is a substantial proportion of all insider transactions that is not as informative as previously expected. In terms of the  $R^2$ , we find no difference in the speed of convergence to market efficiency between stocks with insider trades and all stocks as both stocks have the  $R^2$  in the range of 12%-13%. We find insider sales stocks have a lower degree of information asymmetry but higher speed of convergence to market efficiency than insider buys stocks. The larger trade size of insider sales could increase the price impact and fasten the speed to market efficiency.

Table 3 presents the cross-sectional average of information asymmetry and speed of convergence to market efficiency for stocks with opportunistic insider trades and liquidity insider trades. As discussed earlier, the opportunistic insider trades are insider trades that satisfy two criteria. First, the degree of information asymmetry and the speed of convergence to market efficiency increase in the insider transaction report month. Second, the percentage increases are in the top 30 percentile compared to other stocks in the same month. The liquidity insider trades are non-opportunistic insider trades. By construction, our selection criteria results into the higher degree of information asymmetry and faster speed of convergence to market efficiency for opportunistic insider trade stocks. The information asymmetry of opportunistic insider trades varies from 0.41 to 0.61 while it ranges from 0.30 to 0.36 for liquidity insider trade stocks. Both opportunistic and liquidity insider sales stocks have lower degree of information asymmetry compared to the buy side. The speed to market efficiency or the  $R^2$  varies from 2%-10% for opportunistic trades stocks while it is from 12%-16% for liquidity insider trade stocks.

*Please insert Table 4 around here*

The Table 4 presents cross-sectional average characteristics for all stocks, insider trades, insider buys and sales, opportunistic insider buys and sales, liquidity insider buys and sales. The reported characteristics are market capitalization (in billion baht), the market to book ratio, the monthly volatility (%), the trading value (in million baht) and the quoted

spread (%). We find that insiders trade large stocks but there is no obvious different in firm sizes of opportunistic and liquidity traded stocks. Compared to other stocks, insiders trade growth stocks with high market to book ratio. Similar to firm size, there is no different in the market to book ratio between opportunistic and liquidity insider traded stocks. Panel C shows return volatility and we do not find stocks that all insiders, opportunistic insiders and liquidity insiders trade have different return volatility compared to other stocks. The trading values and quoted spread are reported in Panel D and E. We find insider trade stocks that are more liquid than an average stock. In addition, stocks that insiders sell are more liquid than stocks that insider buys. In summary we observe insiders trade large, high growth and liquid stocks. We find stocks that insiders sell are more liquid than those they buy.

#### **4. Stock Market Reaction to Opportunistic Insider Trades**

We compute stock market reaction to opportunistic insider trades, liquidity insider trades and all insider trades. To ensure that our strategy is realistic and plausible to implement, we consider insider trades based on the filing month (not the actual transaction month which might be on the same month or the earlier month) that the SEC and the public are aware of the transaction. We combine insider stock holdings into insider fund at the end of the month of insider trade. Our insider fund is rebalanced a portfolio at the end of the month that insider sales or purchases. We estimate the degree of information asymmetry and speed of convergence to market efficiency of insider trade stocks and other stocks. Then we determine whether the insider traded stock is an opportunistic insider trade stocks or liquidity insider trade stocks based on the criteria outlined in the above section. Effectively, we construct all insider fund, opportunistic insider fund and liquidity insider fund. Each fund is further classified into a long-short portfolio, a long-only portfolio and a short-only portfolio. The long-only portfolio purchases a stock that insider buys while the short-only portfolio will short-sales a stock that insider sells. The long-short portfolio simply purchases a stock that insider buys and in the same month simultaneously short-sales a stock that insider sells. We then track the

fund performance through time. As our insider trades record begins in January 2002 and ends in December 2008, we examine a one month performance of insider funds for 84 months starting from February 2002 to January 2009. Our analysis implicitly assumes stock prices fully reflect insider trading information within one to two months.

*Please insert Table 5 around here*

This Table reports descriptive statistics of portfolio returns including mean, median, standard deviation, skewness, kurtosis and the Jarque-Bera normality test. Over the period of study, the Thai market gains an average monthly return of 0.72% and the risk free rate is 0.23% per month. Interestingly we observe the negative skewness of -1.13 reflecting the period of global credit crisis in 2008 that the market tumbled by 63%. The Jarque-Bera normality test indicates that the market return is non-normally distributed. The insider trade portfolio earns an average 0.32% per month with a median of -0.22% per month. Clearly, this evidence suggests that an all insider trade portfolio do not outperform the buy-and-hold strategy. We find the all insider buy portfolio performs slightly better than the all insider sell portfolio but none of them beats the buy-and-hold strategy. We find similar results for the three liquidity insider portfolios. The long-short liquidity portfolio produces 0.15% average return while the long-only and short-only portfolio show 0.66% and 0.51% monthly returns respectively.

When we look at an opportunistic insider trade portfolio, we find that it earns an average monthly return of 3.45% with a median of 1.30%. The opportunistic insider buy portfolio yields 2.03% and the opportunistic insider sell portfolio achieves 2.08% average monthly return. The three opportunistic insider funds return are significantly higher than the buy-and-hold average return. The normality test indicates that the opportunistic insider funds returns are fatted-tail. Nevertheless, we apply three portfolio performance measures to assess whether our simple opportunistic insider trade framework can identify an informative insider trade.

*Please insert Table 6 around here*

We evaluate the performance of opportunistic insider funds using a Sharpe ratio, a manipulation-proof performance measure (MPPM) and the Jensen’s alpha. While the Sharpe ratio and Jensen’s alpha are widely used and a standard portfolio performance measure, the MPPM, as its name suggest, is specifically developed to correct weaknesses in the existing performance measures. Ingersoll, Spiegel, Goetzmann, and Welch (2007) point out that Sharpe Ratios suffer from two weaknesses. Firstly, they are based around the assumption that return distributions are normal or lognormal. Secondly, they must be estimated using statistical techniques which assume independent and identically distributed variables. The MPPM, which is not dependent on these limiting assumptions, generates a score which is “(1) increasing in returns (to recognize arbitrage opportunities), (2) concave (to avoid increasing the score via leverage or adding unpriced risk), (3) time separable to prevent dynamic manipulation of the estimated statistics, and (4) has a power form to be consistent with an economic equilibrium.” (Ingersoll, Spiegel, Goetzmann, and Welch, 2007, p. 1506). The MPPM is given below:

$$\hat{\Theta} \equiv \frac{1}{(1-\rho)\Delta t} \ln \left( \frac{1}{T} \sum_{t=1}^T [(1+r_t)/(1+r_{ft})]^{1-\rho} \right) \quad (3)$$

In effect, the  $\hat{\Theta}$  statistic is an estimate of the excess returns certainty equivalent of a portfolio (over and above the risk-free asset) generated after adjusting for risk. The portfolio’s un-annualized return at time  $t$  is  $r_t$ , and the risk-free rate is  $r_{ft}$ .  $T$  is the total number of observations (84 months), and  $\Delta t$  is the length of time between observations. (one month or 1/12 year) Together these two variables annualize the measure.  $\rho$  is risk aversion coefficient. Higher values of  $\rho$  penalise risk more strongly. We set risk-aversion coefficients to 2 ( $\rho = 2$ ). We try several risk-aversion coefficients ( $\rho = 3$  and  $\rho = 4$ ) and they all yield a similar result.

Table 6 shows the Sharpe ratio of buy-and-hold strategy is 0.0644 and the MPPM is -1.94%. The negative MPPM suggests that an investor with a risk-aversion coefficient

of 2 would prefer a risk free return to the buy-and-hold market return during 2002 to 2008. We find the Sharpe ratio of the three all-insider portfolios and the three liquidity insider portfolios to be lower than that of the buy-and-hold strategy. Consistently, their MPPMs are worse than the market return's MPPM. In addition we find no evidence from the Jensen alpha that the all-insider and liquidity-insider portfolios would be better than the buy-and-hold portfolio. On the other hand, we find the long-short opportunistic insider trade yields a higher Sharpe ratio (0.2809), a higher MPPM (22.19%) and a significantly positive Jensen alpha (3.48%). We also find the long-only and short-only opportunistic portfolios show a better Sharpe ratio, higher MPPM and a positive Jensen alpha compared to the market portfolio. Given the non-normality in portfolio returns, we conduct the statistical test between the differences in Sharpe ratio and MPPM using a non-parametric bootstrap approach. We randomly select with replacement from the market return series to generate 1,000 samples and each sample contains 84 observations. We calculate the Sharpe ratio and the MPPM of each sample. The number reported in the square bracket, [ ], are the proportion out of 1,000 bootstraps that the tested portfolio underperforms the market return or the buy and hold strategy. We can see the probability of the long-short opportunistic insider portfolio underperforming the market portfolio is less than 5% for both Sharpe ratio and MPPM. The evidence strongly suggests two things. First, some of insider trades or the so-called opportunistic insider trades contain useful information. Second, our simple framework successfully disentangles opportunistic insider trades from liquidity insider trade.

## **5. Conclusions**

This study proposes a simple framework to identify an opportunistic insider trade from all insider trades. We show public information inferred from opportunistic insider is valuable and could benefit investor for at least one month following the filing month. We find the opportunistic buy portfolio earns an average monthly return of 2.03% and the opportunistic sell portfolio achieves 2.08% monthly return from February 2002 to January 2009. This framework allows us to address several insider trading research topics

more effectively. For instance, one could apply our framework to examine the impact of corporate governance on insider trading. We leave such questions for future research.

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**Table 1**  
**Insider Trades**

Year	No. Of Insider Buys	No. Of Insider Sells	Insider Buy Values (Mil. THB)	Insider Sell Values (Mil. THB)	Insider Buy Trade Size (Mil. THB)	Insider Sell Trade Size (Mil. THB)	Market Return
2002	1,191	1,379	4,182	8,732	4.57	6.76	22%
2003	1,203	2,221	5,401	12,061	3.91	5.77	81%
2004	1,744	1,276	4,654	10,878	2.73	8.92	-3%
2005	2,013	1,768	4,996	17,224	3.73	10.60	14%
2006	413	855	514	6,307	1.66	10.59	-2%
2007	1,466	1,776	2,840	8,630	2.17	4.75	31%
2008	2,463	911	3,688	2,875	2.15	4.54	-63%

This Table shows insider trading activity on the Stock Exchange of Thailand from 2002 to 2008. The data is collected from the File 59-1 and 59-2 from the Securities and Exchange Commission. We report the number, trading values and trade sizes of insider purchases and sales on common stocks. The market return is the value weighed dividend reinvested total return of all common stocks listed on the main board of the Stock Exchange of Thailand available from the Global Financial Database.

**Table 2**  
**Insider Trades, Information Asymmetry and Speed of Convergence to Market Efficiency**

	All Stocks	Insider Trades	Insider Buys	Insider Sales
Panel A: Information asymmetry				
2002	0.48	0.37	0.42	0.32
2003	0.42	0.31	0.39	0.26
2004	0.43	0.32	0.35	0.28
2005	0.45	0.35	0.40	0.31
2006	0.44	0.35	0.40	0.32
2007	0.45	0.33	0.38	0.29
2008	0.48	0.38	0.39	0.33
Panel B: Speed of convergence to market efficiency				
2002	12.69	12.84	14.36	11.77
2003	12.51	12.18	13.18	11.54
2004	12.21	11.21	11.56	10.77
2005	13.28	12.28	12.90	11.72
2006	13.76	15.10	14.70	15.33
2007	12.76	11.81	11.89	11.73
2008	13.46	13.48	13.86	12.66

This Table presents a cross-sectional average of information asymmetry and speed of convergence to market efficiency. The information asymmetry proxy is the absolute percentage change of order imbalance (AIM). Higher AIM indicates higher degree of information asymmetry. The speed of convergence to market efficiency is the  $R^2$  (in percentage) of the predictive regression between daily mid-point return and lagged daily midpoint return and lagged order imbalance within the month. The lower  $R^2$  implies the faster speed of convergence to market efficiency.

**Table 3**  
**Opportunistic and Liquidity Insider Trades, Information Asymmetry and Speed of Convergence to Market Efficiency**

	Opp. Insider Trades	Opp. Insider Buys	Opp. Insider Sales	Liq. Insider Trades	Liq. Insider Buys	Liq. Insider Sales
Panel A: Information asymmetry						
2002	0.61	0.68	0.52	0.33	0.37	0.30
2003	0.43	0.54	0.34	0.30	0.37	0.25
2004	0.45	0.48	0.41	0.30	0.34	0.26
2005	0.41	0.44	0.37	0.35	0.39	0.30
2006	0.51	0.58	0.47	0.32	0.36	0.30
2007	0.53	0.58	0.47	0.32	0.36	0.28
2008	0.52	0.52	0.52	0.36	0.39	0.31
Panel B: Speed of convergence to market efficiency						
2002	3.43	2.09	4.56	13.47	15.23	12.24
2003	5.21	5.06	5.32	12.62	13.73	11.92
2004	2.24	2.25	2.23	11.91	12.41	11.28
2005	3.77	3.80	3.74	13.18	13.95	12.49
2006	9.20	10.67	8.15	15.67	15.15	15.97
2007	2.30	2.19	2.46	12.36	12.61	12.15
2008	2.82	3.03	2.38	14.13	14.50	13.33

This Table presents the cross-sectional average of information asymmetry and speed of convergence to market efficiency under opportunistic insider trades and liquidity insider trades. The opportunistic insider trades are insider trades that satisfy two criteria. First, the degree of information asymmetry and the speed of convergence to market efficiency increase in the insider transaction report month. Second, the percentage increases are in the top 30 percentile compared to other stocks in the same month. The liquidity insider trades are non-opportunistic insider trades.

**Table 4**  
**Stock Characteristics**

	2002	2003	2004	2005	2006	2007	2008
Panel A: Size (Billion Baht)							
All stocks	5.10	6.94	10.30	10.67	11.25	12.21	11.25
Insider trades	9.50	14.41	25.52	24.93	26.05	37.03	34.66
Insider buys	9.58	14.79	20.60	15.48	18.89	17.55	19.79
Insider sales	9.50	14.26	32.70	34.75	30.10	53.31	68.44
Opp. Insider trades	5.49	10.23	20.59	38.44	23.14	12.15	20.54
Opp. Insider buys	6.82	11.19	15.79	16.97	4.35	5.33	11.70
Opp. Insider sales	3.77	9.31	28.31	61.55	35.67	21.25	35.42
Liq. Insider trades	10.06	14.91	25.97	23.27	26.46	38.77	35.71
Liq. Insider buys	10.09	15.34	21.07	15.30	21.17	18.64	20.33
Liq. Insider sales	10.12	14.76	33.12	31.57	29.38	55.05	71.47
Panel B: Market to book ratio							
All stocks	1.07	1.75	1.37	1.44	1.04	2.90	3.06
Insider trades	1.72	2.17	1.99	1.74	0.98	2.01	2.28
Insider buys	1.82	1.80	1.76	1.48	1.63	1.80	2.04
Insider sales	1.62	2.42	2.33	2.02	0.61	2.19	2.81
Opp. Insider trades	1.23	1.50	1.86	1.72	1.62	1.65	2.81
Opp. Insider buys	1.18	1.32	1.72	1.52	1.11	1.45	3.14
Opp. Insider sales	1.34	1.67	2.11	1.93	2.12	1.91	2.24
Liq. Insider trades	1.78	2.25	2.00	1.74	1.90	2.04	2.24
Liq. Insider buys	1.94	1.88	1.76	1.47	1.71	1.83	1.97
Liq. Insider sales	1.65	2.49	2.35	2.03	2.00	2.20	2.86
Panel C: Monthly Volatility							
All stocks	12.91%	13.62%	11.75%	10.12%	11.24%	9.39%	13.43%
Insider trades	12.59%	14.29%	12.44%	9.62%	12.36%	9.45%	13.46%
Insider buys	11.52%	14.25%	11.96%	9.77%	13.69%	9.58%	13.82%
Insider sales	13.53%	14.24%	13.09%	9.50%	11.58%	9.32%	12.65%
Opp. Insider trades	12.29%	12.83%	10.58%	8.45%	9.53%	8.07%	12.93%
Opp. Insider buys	12.34%	12.49%	10.67%	9.37%	10.87%	7.84%	15.78%
Opp. Insider sales	12.22%	13.21%	9.98%	7.55%	8.53%	8.41%	8.17%
Liq. Insider trades	12.61%	14.40%	12.59%	9.73%	12.73%	9.54%	13.50%
Liq. Insider buys	11.42%	14.42%	12.08%	9.82%	14.12%	9.74%	13.69%
Liq. Insider sales	13.63%	14.31%	13.28%	9.69%	11.94%	9.37%	13.06%

**Table 4 Continued**  
**Stock Characteristics**

	2002	2003	2004	2005	2006	2007	2008
Panel D: Trading Value (Million Baht)							
All stocks	0.38	0.96	0.94	0.70	0.63	0.63	0.65
Insider trades	0.71	1.78	2.11	1.66	1.14	1.93	1.90
Insider buys	0.49	1.31	1.61	1.07	0.89	0.74	1.11
Insider sales	0.90	2.09	2.84	2.26	1.28	2.93	3.70
Opp. Insider trades	0.28	1.26	1.51	2.01	0.67	0.32	1.10
Opp. Insider buys	0.22	0.90	0.97	1.05	0.20	0.20	0.81
Opp. Insider sales	0.37	1.60	2.36	3.05	0.99	0.48	1.58
Liq. Insider trades	0.77	1.84	2.17	1.61	1.20	2.04	1.96
Liq. Insider buys	0.55	1.38	1.68	1.07	1.00	0.78	1.13
Liq. Insider sales	0.96	2.14	2.88	2.17	1.32	3.06	3.89
Panel E: Quoted Spread							
All stocks	1.22%	0.97%	1.04%	0.98%	0.90%	0.83%	1.34%
Insider trades	0.76%	0.73%	0.78%	0.62%	0.63%	0.55%	0.95%
Insider buys	0.89%	0.80%	0.89%	0.79%	0.71%	0.62%	1.09%
Insider sales	0.64%	0.68%	0.61%	0.46%	0.59%	0.49%	0.62%
Opp. Insider trades	1.20%	1.00%	0.82%	0.54%	0.90%	0.80%	1.06%
Opp. Insider buys	1.56%	0.80%	0.98%	0.67%	1.55%	0.65%	1.28%
Opp. Insider sales	0.73%	1.21%	0.52%	0.39%	0.39%	1.03%	0.64%
Liq. Insider trades	0.72%	0.71%	0.77%	0.63%	0.60%	0.54%	0.94%
Liq. Insider buys	0.82%	0.80%	0.89%	0.80%	0.58%	0.62%	1.07%
Liq. Insider sales	0.64%	0.65%	0.62%	0.46%	0.61%	0.47%	0.62%

This Table presents five stock characteristics conditional on insider trades types. The characteristics are market capitalization (in billion baht), the market to book ratio, the monthly volatility (%), the trading value (in million baht) and the quoted spread (%). We report cross-sectional average characteristics for all stocks, insider trades, insider buys and sales, opportunistic insider buys and sales, liquidity insider buys and sales.

**Table 5**  
**Descriptive Statistics of Portfolio Returns**

	Mean	Median	StdDev	Skewness	Kurtosis	JB- pvalue
Market return	0.72%	1.67%	7.58%	-1.13	0.93	0.00
Risk free	0.23%	0.20%	0.11%	0.25	1.67	0.03
Insider Trades	0.32%	-0.22%	8.37%	0.22	5.63	0.00
Insider buys	0.64%	0.76%	9.03%	-0.85	9.01	0.00
Insider sales	0.32%	-0.06%	6.77%	0.05	2.62	0.78
Opp. Insider trades	3.45%	1.30%	12.27%	0.81	4.71	0.00
Opp. Insider buys	2.03%	0.44%	11.98%	1.05	5.30	0.00
Opp. Insider sales	2.08%	1.57%	10.51%	-0.39	7.08	0.00
Liq. Insider trades	0.15%	-0.35%	8.79%	0.14	5.83	0.00
Liq. Insider buys	0.66%	0.42%	9.34%	-0.98	9.54	0.00
Liq. Insider sales	0.51%	0.52%	6.78%	0.08	2.76	0.88

This Table reports descriptive statistics of portfolio returns over 84 months period from February 2002 to January 2009. It shows the mean, median, standard deviation, skewness, kurtosis and the Jarque-Bera normality test probability value.

**Table 6**  
**Portfolio Performance of Opportunistic and Liquidity Trades**

	Sharpe ratio	MPPM	Jensen alpha	Beta
Market portfolio	0.0644	-1.94%	0.00%	1.00
Insider trades	0.0379	-7.17%	0.26%	0.08
	[0.604]	[0.685]	(0.28)	(0.37)
Insider buys	0.0470	-6.16%	-0.08%	0.76
	[0.579]	[0.661]	(-0.11)	(5.35)***
Insider sales	-0.0791	-11.93%	-0.09%	-0.67
	[0.914]	[0.821]	(-0.18)	(-5.99)***
Opp. Insider trades	0.2809	22.19%	3.48%	-0.05
	[0.041]**	[0.012]***	(2.44)**	(-0.28)
Opp. Insider buys	0.1513	6.32%	1.38%	0.62
	[0.240]	[0.245]	(1.17)	(6.00)***
Opp. Insider sales	0.1768	9.17%	1.88%	-0.71
	[0.191]	[0.170]	(1.56)	(-3.77)***
Liq. Insider trades	0.0171	-10.21%	0.07%	0.12
	[0.680]	[0.778]	(0.07)	(0.50)
Liq. Insider buys	0.0474	-7.08%	-0.08%	0.78
	[0.579]	[0.684]	(-0.11)	(5.16)***
Liq. Insider sales	0.0290	-14.23%	-0.28%	-0.66
	[0.636]	[0.804]	(-0.55)	(-5.95)***

This Table shows three portfolio performance measures. Sharpe ratio is the ratio of excess portfolio return to its standard deviation. MPPM is the Manipulation-Proof Performance Measure (MPPM) of Ingersoll, Spiegel, Goetzmann, and Welch (2007). The Jensen alphas and betas are estimated from the time-series regression between excess portfolio returns and excess market returns. In all instances, we compare the performance of the insider trades, opportunistic insider trades and liquidity insider trades portfolios to the buy-and-hold strategy. The market return is the value weighed all common stock returns. The risk free rate is the total Treasury Bill return. Both market return and risk free rate are available from the Global Financial Database. The number in the square bracket, [ ], represent the “Bootstrap” p-values from a non-parametric bootstrap approach. It indicates the proportion out of 1,000 bootstraps that the portfolio underperforms the buy-and-hold strategy. The numbers in the parenthesis, ( ), are the Newey-West Heteroskedasticity and Autocorrelation adjusted t-statistics. \*\*\*, \*\*, and \* denote 99%, 95% and 90% significance level.